Working with VPNs

# Objective

To gain practical experience using VPNs and understand how they contribute to privacy, encryption, and secure communication.

# Tools Used

- VPN Client: ProtonVPN (Free Tier)  
- IP Check Tool: whatismyipaddress.com  
- Browser: Google Chrome  
- System Used: Windows 10

# Steps Followed

## 1. Chose a Free VPN Service

Selected ProtonVPN, known for strong privacy policies and no data limits on the free plan.

## 2. Signed Up on ProtonVPN

Created an account using email verification at https://protonvpn.com.

## 3. Downloaded and Installed VPN Client

Downloaded the ProtonVPN client for Windows and installed it successfully.

## 4. Connected to a VPN Server

Connected to the Netherlands server. Connection was stable and successful.

## 5. Verified IP Address

Before VPN: Showed actual IP and city in India.  
After VPN: IP address changed to a Netherlands-based IP on whatismyipaddress.com.

## 6. Checked Encrypted Browsing

Accessed multiple websites, and confirmed via lock icon in URL bar that traffic was HTTPS-encrypted.

## 7. Disconnected VPN

Disconnection restored original IP. Compared browsing speeds:  
- With VPN: Slightly slower.  
- Without VPN: Normal speed.

## 8. Analyzed VPN Features

- Encryption Used: AES-256 encryption standard.  
- Protocols Supported: OpenVPN, WireGuard.  
- No-log Policy: ProtonVPN strictly follows a no-log policy.

# Summary: VPN Benefits & Limitations

## Benefits:

- Masks real IP and location  
- Encrypts internet traffic, enhancing privacy  
- Prevents tracking by ISPs and websites  
- Bypasses geo-restrictions and censorship

## Limitations:

- Slower internet speed due to tunneling overhead  
- Free VPNs may offer fewer server choices  
- Cannot guarantee complete anonymity  
- Some websites may block VPN traffic

# Interview Questions & Answers

## 1. What is a VPN?

A VPN (Virtual Private Network) creates a secure, encrypted connection between your device and a remote server, protecting your internet activity.

## 2. How does a VPN protect privacy?

It hides your IP address and encrypts your data, making it unreadable to ISPs, hackers, or surveillance tools.

## 3. Difference between VPN and Proxy?

A proxy only hides your IP for specific apps/websites; a VPN encrypts all internet traffic system-wide.

## 4. What is encryption in VPN?

It is the process of converting data into a secure format (like AES-256) that prevents unauthorized access.

## 5. Can a VPN guarantee complete anonymity?

No. It enhances privacy but doesn't make you 100% anonymous (web tracking, browser fingerprints still apply).

## 6. What protocols do VPNs use?

Common protocols include OpenVPN, IKEv2, WireGuard, and L2TP/IPSec.

## 7. What are some VPN limitations?

Slower speeds, server restrictions, compatibility issues, and limited privacy in free plans.

## 8. How does a VPN affect network speed?

It may reduce speed due to encryption overhead and the distance to the VPN server.

# GitHub Repository Structure

working-with-vpns/  
├── README.md  
├── screenshots/  
│ ├── before\_vpn\_ip.png  
│ ├── after\_vpn\_ip.png  
│ ├── vpn\_connected.png  
│ └── speedtest\_comparison.png (optional)  
└── vpn\_report.docx